

Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1-7. *(canceled)*.

8. *(currently amended)* ~~The system of claim 1,~~ A system comprising:
a forward error correction encoder that encodes a first signal to produce a
second signal;
an interleaver that interleaves the second signal to produce a third signal;
a transmission system used to transmit the third signal;
a de-interleaver that de-interleaves the third signal and a possible error
signal combined with the third signal to produce a fourth signal, such that any burst of
the error signals is spread out; and
a forward error correction decoder that decodes the fourth signal to
produce a fifth signal,

wherein the transmission system comprises first and second frequency domain multiplexed transceivers that transmit and receive the third signal and the possible error signal over one of a wire or wireless transmission medium.

9. *(currently amended)* ~~The system of claim 1,~~ A system comprising:
a forward error correction encoder that encodes a first signal to produce a
second signal;
an interleaver that interleaves the second signal to produce a third signal;
a transmission system used to transmit the third signal;
a de-interleaver that de-interleaves the third signal and a possible error
signal combined with the third signal to produce a fourth signal, such that any burst of
the error signals is spread out; and
a forward error correction decoder that decodes the fourth signal to
produce a fifth signal,

wherein the transmission system comprises first and second time domain multiplexed transceivers that transmit and receive the third signal and the possible error signal over one of a wire or wireless transmission medium.

10. *(currently amended)* ~~The system of claim 1,~~ A system comprising:
a forward error correction encoder that encodes a first signal to produce a second signal;
an interleaver that interleaves the second signal to produce a third signal;
a transmission system used to transmit the third signal;
a de-interleaver that de-interleaves the third signal and a possible error signal combined with the third signal to produce a fourth signal, such that any burst of the error signals is spread out; and
a forward error correction decoder that decodes the fourth signal to produce a fifth signal,

wherein the transmission system comprises first and second frequency domain-time domain multiplexed transceivers that transmit and receive the third signal and the possible error signal over one of a wire or wireless transmission medium.

11. *(canceled).*

12. *(currently amended)* ~~The system of claim 1, further comprising:~~ A system comprising:
a forward error correction encoder that encodes a first signal to produce a second signal;
an interleaver that interleaves the second signal to produce a third signal;
a transmission system used to transmit the third signal;
a de-interleaver that de-interleaves the third signal and a possible error signal combined with the third signal to produce a fourth signal, such that any burst of the error signals is spread out; and
a forward error correction decoder that decodes the fourth signal to produce a fifth signal,

a first multiplexer that produces a plurality of first signals; and
a second multiplexer that produces the fifth signal from a plurality of fourth signals,

wherein the encoding FEC and the decoding FEC include a plurality of encoding FECs and a plurality of decoding FECs, a number of each corresponding to a number of the plurality of first signals,

wherein the possible error signals are spread over the plurality of fourth signals.

13. (*original*) The system of claim 12, wherein the transmission system comprises a plurality of channels corresponding a number of the plurality of the first signals.

14. (*original*) The system of claim 13, wherein the plurality of channels have substantially equal signal-to-noise ratios.

15. (*canceled*).

16. (*original*) A system comprising:
a two-stage multiplexing system;
a two-stage interleaving system, wherein each stage of the interleaving system is positioned subsequent to a corresponding stage of the multiplexing system;
a transmission system coupled between a second stage of the interleaving system and a first stage of a two-stage de-interleaving system;
a two-stage de-multiplexing system, wherein each stage of the de-multiplexing system is positioned subsequent to a corresponding stage of the de-interleaving system.

17. (*original*) The system according to claim 16, wherein:
 a first stage of the multiplexing separates a multi-dimensional input signal into each of its dimensions;
 a first stage of the interleaving system interleaves each dimension of the input signal to form second signals;
 a second stage of the multiplexing system distributes each bit of the second signal to one of a plurality of frequency tones; and
 a second stage of the interleaving system interleaves each of the frequency tones of each of the second signals to form a transmission signal.

18. (*original*) The method of claim 17, wherein step (a) further comprises:
 (a1) using a multi-dimensional signal as the first signal;
 (a2) directing each dimension of the multi-dimensional first signal along a separate conductor; and
 (a3) encoding each dimension of the multi-dimensional first signal, wherein steps (b)-(d) are performed for each dimension.

19-21. (*canceled*).

22. (*new*) The system of claim 8, wherein the first signal and second signal comprise multi-dimensional data.

23. (*new*) The system of claim 8, wherein the interleaver forms the third signal using a sequential interleaving pattern.

24. (*new*) The system of claim 8, wherein the interleaver forms the third signal using a random interleaving pattern.

25. (*new*) The system of claim 9, wherein the first signal and second signal comprise multi-dimensional data.

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Scott POWELL
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26. (*new*) The system of claim 9, wherein the interleaver forms the third signal using a sequential interleaving pattern.

27. (*new*) The system of claim 9, wherein the interleaver forms the third signal using a random interleaving pattern.

28. (*new*) The system of claim 10, wherein the first signal and second signal comprise multi-dimensional data.

29. (*new*) The system of claim 10, wherein the interleaver forms the third signal using a sequential interleaving pattern.

30. (*new*) The system of claim 10, wherein the interleaver forms the third signal using a random interleaving pattern.